

*Adenaplostoma monniotorum* n. gen., n. sp.,  
a strange copepod parasite of a compound ascidian  
from New Caledonia  
(Crustacea, Copepoda, Cyclopoida, Ascidicolidae)

by Jan H. STOCK

**Abstract.** — A new genus and species, *Adenaplostoma monniotorum*, belonging to the copepod family Ascidicolidae, is described. It was found in the synascidian *Didemnum hiopaa*, from New Caledonia. The new taxon has one unique feature, the presence of a paired glandular organ on the cephalosome. Other characters are a mixture of features used to define various subfamilies within the Ascidicolidae. Therefore it was judged necessary to erect a new subfamily, Adenaplostomatinae, for the conception of the new genus.

**Résumé.** — *Adenaplostoma monniotorum*, nouveau genre, nouvelle espèce de copépode de la famille des Ascidicolidae, est décrit. Il a été recueilli en association avec la synascidie *Didemnum hiopaa* de Nouvelle-Calédonie. Le nouveau taxon présente une seule caractéristique originale : un organe glandulaire double sur le céphalosome. Ses autres caractères existent tous déjà chez les unes et les autres sous-familles faisant partie des Ascidicolidae. Toutefois, afin de bien définir le nouveau genre il a été jugé utile de créer une nouvelle sous-famille, les Adenaplostomatinae.

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INTRODUCTION

The family Ascidicolidae and its various subfamilies were ably monographed by ILLG & DUDLEY (1980). In the present paper, I have followed their taxonomic arrangement closely. The only noteworthy addition after 1980 to the Haplostomatinae (see OISHI & ILLG, 1977), the subfamily which comes closest to the taxon described here, is the description of a new genus and species by C. MONNIOT (1982), called *Paulillgia polycarpae* from the Bay of Biscay. Various important differences with other members of the Ascidicolidae, induced me to describe the material at hand as a new species, in a new genus, belonging to a new subfamily.

MATERIAL AND METHODS

I owe to Drs. Françoise and Claude MONNIOT, Muséum national d'Histoire naturelle (Invertébrés marins et Malacologie), Paris, two specimens of the copepod described in this paper. One of the specimens was cleared with Genitase, a proteolytic enzyme (see KANAAR, 1990) in order to make all appendages better visible. The other specimen remained untreated. Both specimens were studied using the hanging-drop method described by HUMES & GOODING (1964).

ADENAPLOSTOMATINAE n. subfam.

Subfamily of Ascidicolidae.

*Female* : Antenna 1 large but unsegmented and unarmed (but for minute, scattered spinules). Antenna 2 small, bimerous, with strong terminal claw. Cephalosome, behind insertion of antenna 1, with large glandular organ on each lateral side. Labrum well-developed. Mandible styliform. Maxillae 1 and 2 reduced to small setiferous lobes. Maxilliped absent. Legs 1 to 4 biramous, rami unsegmented. Leg 5 represented by small, ventrally inserted, spiniform process. Caudal rami reduced to swelling of anal somite, only bearing some minute spinules. Anus terminal. Vulval aperture not reinforced by sclerotizations. Eggs incubated in internal, dorsal brood-pouch.

*Male* : Unknown.

TYPE-GENUS : *Adenaplostoma* n. gen.

ADENAPLOSTOMA n. gen.

With the characters of the subfamily Adenaplostomatinae. Gender neuter.

TYPE-SPECIES : *A. monniotorum* n. sp.

DERIVATIO NOMINIS : Generic name derived from  $\alpha\delta\eta\nu$  (Greek = gland) and *Aplostoma* (for reasons of euphony, CANU's (1896) original, but preoccupied, spelling is used, instead of *Haplostoma*, as the genus is presently known), one of the generic units in the family Ascidicolidae. I take great pleasure in dedicating the new species to Drs. Françoise and Claude MONNIOT, of Paris, both well-known specialists in tunicates and ascidicofous copepods, who were kind enough to entrust me the material on which the present paper is based.

REMARKS

ILLG & DUDLEY (1980) have discussed *in extenso* the composition and characters of the Ascidicolidae, in relation with those of the Notodelphyidae. For the more plesiomorphic members of both families, the distinction is easily made, but for members with strong apomorphic reductions in most or all appendages (such as *Adenaplostoma*) it is hard to decide to which family they belong. *Adenaplostoma* possesses a dorsal brood pouch, like all members

of the family Notodelphyidae. But this character does not suffice to classify the new genus with that family, since the presence of a brood pouch is not a monophyletic character, at least three different families of copepods, partially unrelated, possess brood pouches, viz. the Gastrodelphyidae, Notodelphyidae and Ascidicolidae (subfamily Buprorinae).

The prehensile distal claw of antenna 2 is considered characteristic for the Notodelphyidae, but in some members, although classified with this family, the claw is reduced (e.g. in *Bremenia illgi* Laubier & Lafargue, 1974) or absent (e.g. in the genus *Achelidelphys* Lafargue & Laubier, 1977). In the Ascidicolidae on the contrary, a dagger-shaped spine or claw may be present at the distal end of the 2nd antenna, which I consider homologous with the prehensile claw of the Notodelphyidae (e.g. in *Haplosaccus elongatus* Ooishi & Illg, 1977).

Prior to ILLG & DUDLEY's monograph, a number of genera has been described that resemble *Adenaplostoma* to a certain extent, viz. *Bremenia* Chatton & Brément, 1915, *Achelidelphys* Lafargue & Laubier, 1977, and *Anoplodelphys* Lafargue & Laubier, 1978. These genera were, mainly because of the presence of a dorsal brood pouch, included in the Notodelphyidae. As mentioned above, the brood pouch is a polyphyletic character, and as such not useful to base a family allocation upon. Most of the remaining similarities between these genera and *Adenaplostoma* reside in reductions due to an endoparasitic life, and are not necessarily synapomorphisms, but may be convergencies. Since no data on the larval development and the male morphology of any of these genera are available, I am unable to decide if they really belong in the Notodelphyidae, or — what I think is not unlikely — in the Ascidicolidae.

In my opinion, the 2nd antenna, the prominent labrum, the reduced mouthparts and legs of the new genus are in better agreement with the Ascidicolidae than with those of other families.

Within the Ascidicolidae, *Adenaplostoma* agrees with the subfamily Buprorinae in the presence of an internal dorsal brood pouch; all other subfamilies lack this pouch and carry external ovisacs. However, antennae, mouthparts, and legs are segmented, richly armed structures (the plesiomorphic state) in the Buprorinae, suggesting a common ancestry with the Notodelphyidae, whereas in *Adenaplostoma* these appendages are strongly reduced apomorphically. According to the key to the subfamilies presented by ILLG & DUDLEY (1980), *Adenaplostoma* fits best in the Haplostomatinae<sup>1</sup>. However, in Haplostomatinae, a maxilliped is always present (absent in *Adenaplostoma*), and of course Haplostomatinae have external ovisacs and vulval sclerotizations (both lacking in *Adenaplostoma*).

With the Enteropsinae the new genus agrees in absence of maxillipeds, but disagrees in the presence of a fifth leg and biramous legs I to 4. Botryllophyllinae have quite different (viz., prehensile) caudal rami and much more plesiomorphic first and second antennae, mouthparts and legs. The remaining subfamilies (Ascidicolinae, Enterocolinae and Enterognathiinae) differ from *Adenaplostoma* substantially in having expanded, lamelliform or lobate, fifth legs, covering the basis of the ovisacs. *Adenaplostoma* differs from all members of the family in possessing a large glandular organ on either side of the cephalic region, whereas the styliform mandible is also an autapomorphy. Taking these agreements and differences into consideration, it was thought best to create a new subfamily for the New Caledonian copepods.

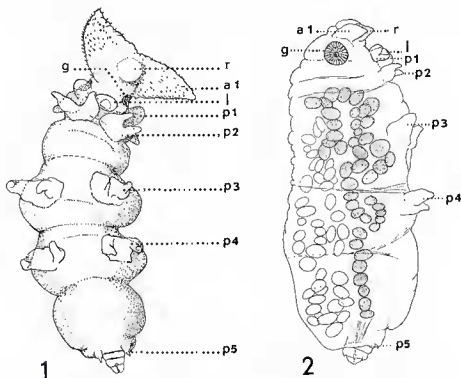
1. All previous authors (CHATTON & HARANT, 1924; GOTTO, 1959; OOSHII & ILLG, 1974; 1977; ILLG & DUDLEY, 1980; MONNIOT, 1982) use the spelling Haplostomatinae, which I do not consider grammatically correct.

*Adenaplostoma monniotorum* n. sp.

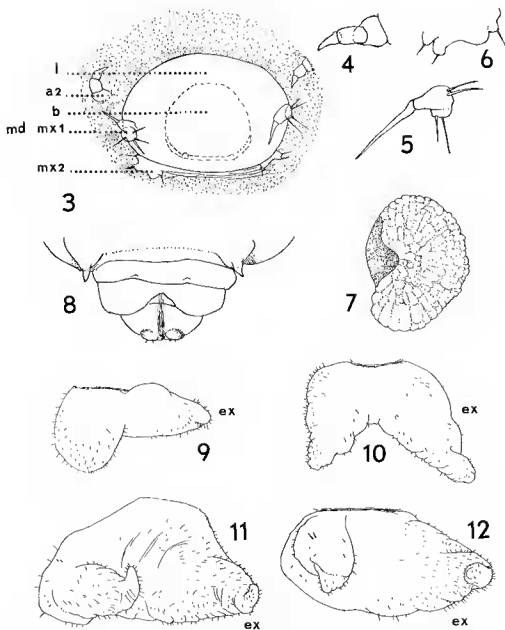
MATERIAL EXAMINED : Two mature females, one of which holotype (Muséum national d'Histoire naturelle, Paris, no. MNHN Cr. 962), the other paratype (Zoölogisch Museum Amsterdam, ZMA Co. 200.346). In *Didemnum hiopaa* Monniot & Monniot, 1987 ; New Caledonia, Balise de l'Îlot Maître (off Nouméa), 6-9 m, no date.

DESCRIPTION OF FEMALE PARATYPE

Body length (mid-anterior body end to tip of anal somite) 2.44 mm ; greatest body width (at level of 4th pedigerous somite) 0.99 mm. Body swollen ; somites bearing legs 1, 2, 3, 4 and 5 separated by indistinct segmentation lines or cuticular folds, but clearly indicated by lateral swellings of somites 2 to 5 (figs. 1, 2). Cephalic and first pedigerous somites fused. Urosome 3-segmented, very much narrower than pedigerous somite 5. Anal somite with 2 swellings, no doubt rudiments of caudal rami, armed with some minute spinules. Anus terminal.



FIGS. 1-2. — *Adenaplostoma monniotorum* n. gen., n. sp. : 1, female holotype, ventral ; 2, female paratype, from the right. Eggs in ovaries dotted ; eggs in incubatory pouch open. a1 = first antenna ; g = glandular organ ; l = labrum ; p1 — p5 = first to fifth legs ; r = rostrum.



FIGS. 3-12. — *Adenaplostoma monniotorum* n. gen., n. sp., female paratype: 3, general organization of oral area, ventral; 4, second antenna; 5, mandible and first maxilla; 6, second maxilla; 7, left glandular organ, dorsal view; 8, posterior end of body, ventral; 9, first right leg, ventral; 10, second right leg, ventral; 11, third right leg, ventral; 12, fourth right leg, ventral.

a2 = second antenna; b = mouth; ex = exopodite; l = labrum; md = mandible; mx1 = first maxilla; mx2 = second maxilla.

Antenna 1 huge, pointing laterally or lateroventrally, unsegmented, fleshy, triangular (fig. 1), armed with minute, scattered spinules only.

Between the left and right first antenna, a fleshy lobe, directed ventrad, represents the rostrum (figs. 1, 2).

Just caudad of the posterior insertion point of antenna 1, each laterodorsal margin of the cephalosome bears a large organ, looking at first sight as a compound, sessile eye of certain higher Crustacea. This organ is circular in lateral view (fig. 2), but somewhat reniform in dorsal view (fig. 7). Upon closer inspection, the organ bears a lateral invagination, at the bottom of which opens a pore. This makes it likely that the organ is a gland of some sort, the function of which remains unknown at present.

The centre of the cephalosome is occupied by a protruding, egg-shaped labrum of considerable size (figs. 1, 3), around which are arranged antenna 2, mandible and maxillae 1 and 2. The mouth, covered by the labrum, is large as well, almost circular.

Antenna 2 (fig. 4) is very small, consisting of 2 unarmed proximal segments, and a heavy distal claw. Mandible (fig. 5) styliiform. Maxilla 1 (fig. 5) apparently bilobed, bearing 4 setae. A trilobed, tiny structure near the posterior edge of the labrum (fig. 6) is interpreted as a rudiment of maxilla 2. No trace of maxillipeds found.

Leg 1 (fig. 9) placed close to labrum (fig. 1), biramous, both rami unsegmented. Endopodite semi-circular, exopodite bluntly tapering; both rami covered by scattered minute spinules. Legs 2 to 4 (fig. 10-12) more or less similar to one another: biramous, exopodite slightly larger than endopodite, both rami unsegmented, bluntly tapering, tips sometimes recurved, covered with scattered spinules.

Last pedigerous somite slightly narrower than pedigerous somite 4, swollen, with convex lateral contours, indented near posterior end (fig. 1). Fifth leg implanted at ventroposterior margin, consisting of pointed, unsegmented lobe (fig. 8).

Ovaries located in ventral part of pedigerous somites 1 to 5, arranged in 2 sinuous, irregular strings. Dorsal part of same somites functioning as incubatory pouch (fig. 2).

Male unknown.

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